



## **Leading by Example - City Facilities and Operations**

# Energy Performance Contract



- **City of Boulder's EPC Program Goals**
  - **Reduce energy use, water use and costs across all city operations**
  - Upgrade aging infrastructure in a fiscally constrained funding environment
  - **Reduce GHG emissions by 20 percent**
  - Leverage ARRA, State and utility funding opportunities
  - Improve comfort, aesthetics, productivity
  - Incorporate renewable technology and maximize demand side management opportunities
  - Add/Improve building automation systems
  - **Lead by example**

# EPC Financials & Benefits



Item	Total
Total Project Value	\$16,232,960
- Xcel Energy Rebates – one time	(\$2,042,957)
- Energy Efficiency and Conservation Block Grant	(\$360,000)
- City Capital	(\$2,385,058)
Financed Amount	\$11,139,262

- Stimulus funding (EECBG) only 2% of funds
- 24 of 28 (86%) of contractors in Colorado, with 13 (54%) in Boulder area
- \$11.5M to subcontractors
  - \$6M for labor -- 422 people employed in 3-year timeframe
  - 91 new jobs created
- McKinstry's professional staff increased from 14 to 35 in 3 years

# EPC Results



Item	Total (Annual)
Electricity Reduction	7,883,532 kWh
Gas Reduction	180,680 therms
Water Reduction	2,796 kgals
Utility Cost Savings	<b>\$667,614</b>
Maint Cost Savings	\$52,615 (3-years only)
CO2 Reduction	<b>8,216 mtons (24.4%)</b>
Future Capital Avoided	\$3,354,460 (one-time)
On-going Incentives: - PV REC payments - Colorado Carbon Fund REC payments	\$97,062 \$50,000 total (one-time)

# EPC Guaranteed Results



Description	Electricity (kWh/yr)	Natural Gas (therms/yr)	Actual Annual CO2 (metric tons)
2008 Facilities Baseline Energy	31,338,062	950,223	
(metric tons)	27,363	5,047	<b>33,710</b>
Measures:			
- Energy Efficiency in EPC	(5,610,760)	(157,040)	(6,806)
- Solar PV EPC	(1,429,193)		(1,284)
- Solar Thermal at Rec Centers, EPC		(8,760)	(126)
- Energy Education, EPC *	(tbd)	(tbd)	Assumed same
- Total Reduction from 2008 Baseline			<b>(8,216) = 24.4%</b>

# Awareness & Engagement



## powerED program:

- Behavior change campaign for city facility occupants
- Goal is 10% reduction in energy consumption
- Partnership between McKinstry and City of Boulder

## Focuses on:

- People: engage **occupants** and increase awareness
- Process: engage **operators** and optimize systems
- Performance: energy savings progress tracking and reporting (dashboard)

peoplepowerplanet



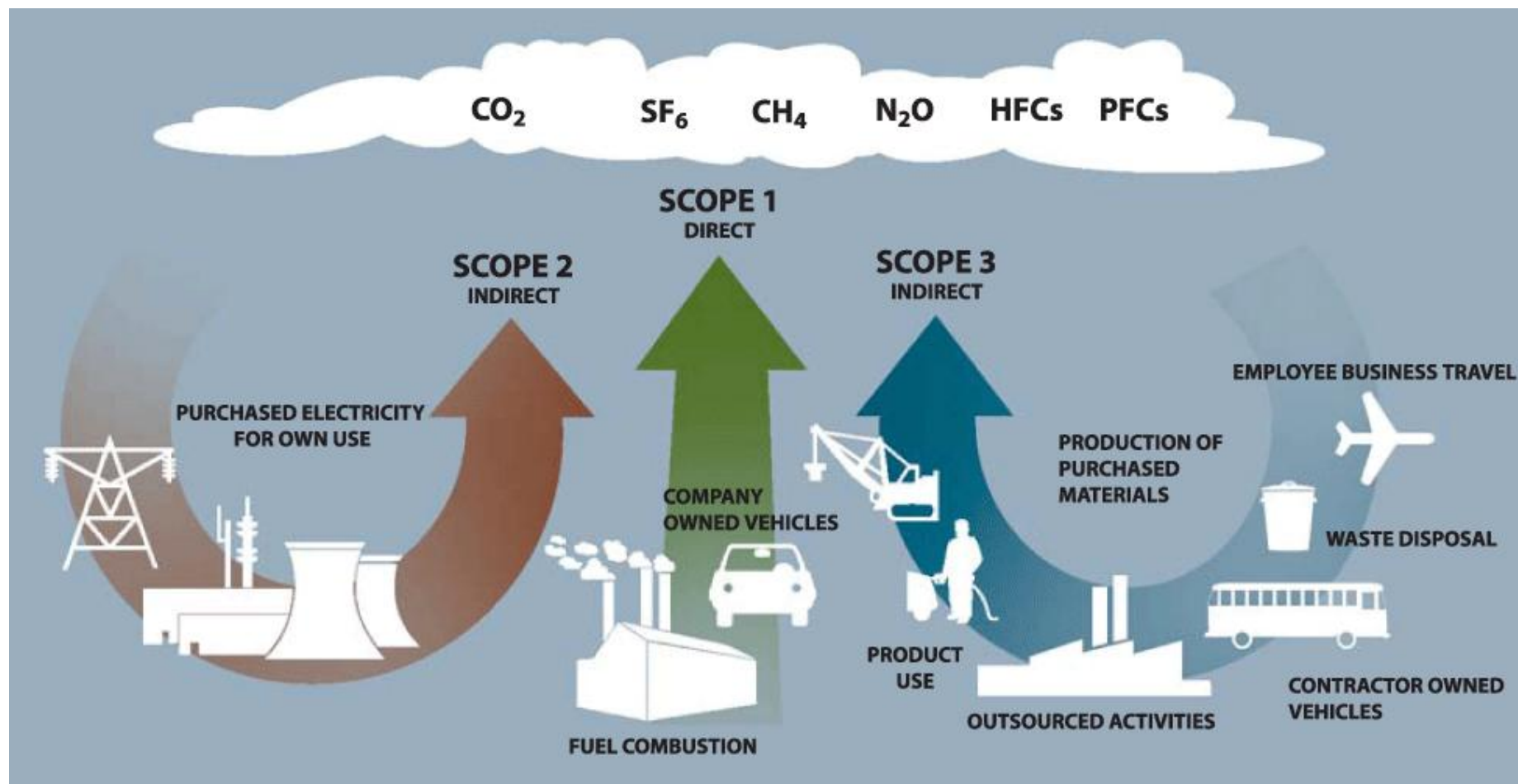
# Commercial Energy Rating



## Energy Rating for 28 city facilities:

- Over 80% of all city facility energy use being rated
- 1<sup>st</sup> Quarter/2013 roll-out with powerEd program
- Using ENERGY STAR Portfolio Manager ratings and/or energy use intensities scores

# GHG Emissions Inventory



Added Scope 3 emissions to our GHG Inventory



# GHG Inventory Decisions



*Local Government Operations Protocol v 1.1, May 2010*] <http://www.theclimateregistry.org/downloads/2010/05/2010-05-06-LGO-1.1.pdf>

**Base year:** 2008

**Boundary:** Operational control - owns and operates-measure what you manage

**Electricity emissions factor:** eGRID

1.2% increase from 2005-2007

*1,883 lbs CO<sub>2</sub>/MWh to 1,906 lbs CO<sub>2</sub>/MWh*

**Scope 3:** employee commute, business travel, wells-to-pump, materials, solid waste



# Sources of Emissions



**Inventory Boundary: All facilities, vehicles, etc. operated**

Not including facilities leased to others

Not including jointly owned facilities not operated

## **Stationary Sources**

Buildings and Facilities

Public Lighting-streetlights,  
traffic signals

Water Treatment & Transport-  
pumps, irrigation

Refrigerants

## **Solid Waste from Government Operations**

## **Wastewater Treatment Facility**

## **Mobile Emissions**

Vehicle Fleet

Mobile Equipment

Refrigerants

Wells-to-Pump (Scope 3)

## **Materials Production**

Asphalt & Cement

Copy Paper

Computers & Hardware

Fertilizer

Food

## **Employee Commute**

## **Business Travel**

# Emission Reduction Efforts

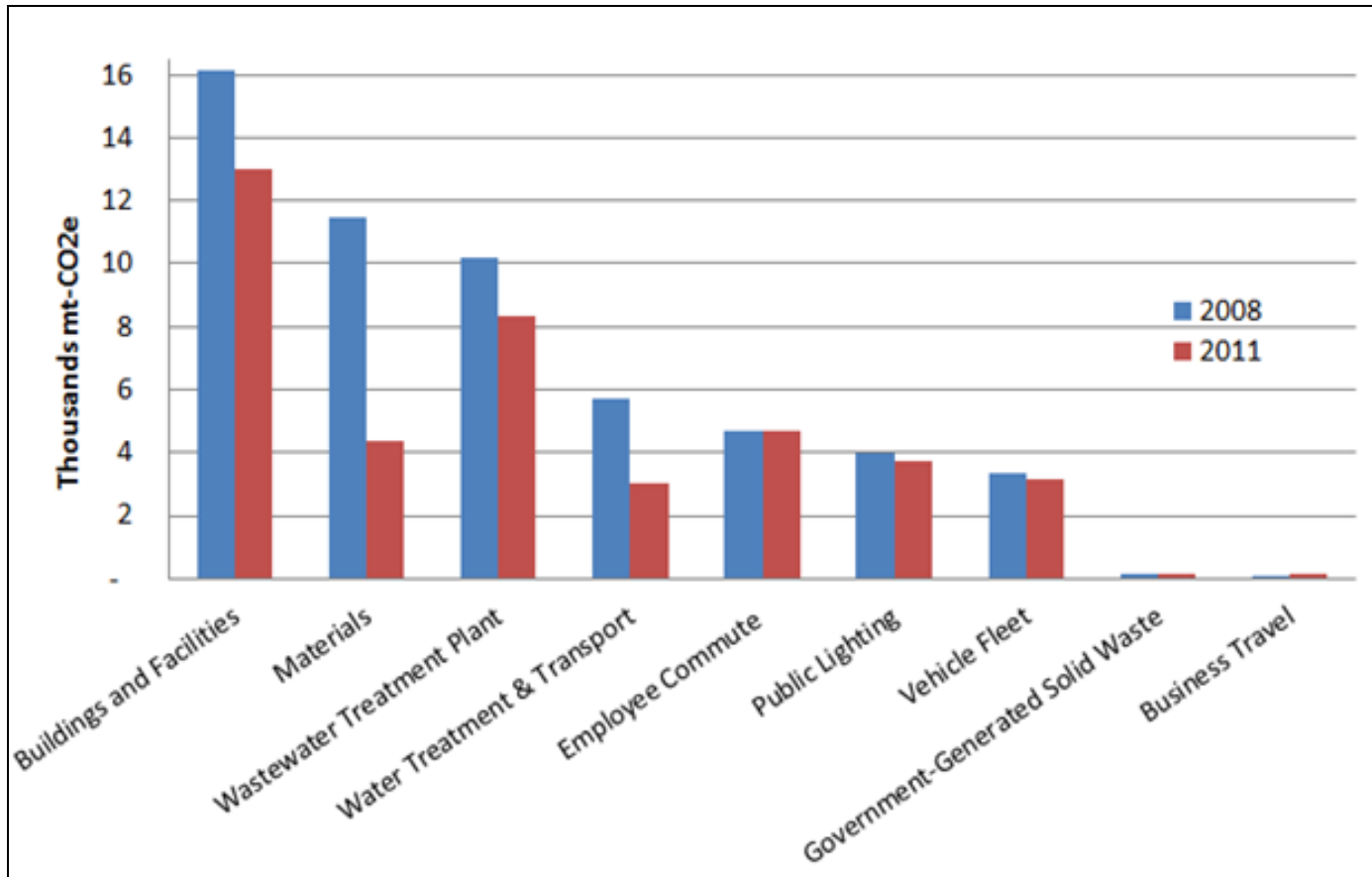


- EPC: 24.4% reduction from buildings sector for all 3 phases, 13.6% reduction in total GHG emissions
- Recycling, composting: +200 tons recycled, +11 tons composted (2009)~4% reduction waste – zero waste (2010)
- 2012 LED traffic signals: 75%
- Recycled asphalt: 20% (same)
- Vehicle fleet: 100% AFVs for new, maintain VMT budget, biofuels (B2-2011, B10 & B20 use), EVs with renewables
- Transportation: Ecopass, bikes and carpooling (same)
- Environmental purchasing policy (recycled paper, environmentally certified products, etc. - same)
- Hydro production, WWTP cogen, more solar / wind (same)

# City Facilities – Other Emission Sources



## 2008 & 2011 GHG Emissions by Sector



### Reductions

Buildings – 20%

Materials – 62%

Wastewater – 19%

Water – 47%

Public Lights – 6%

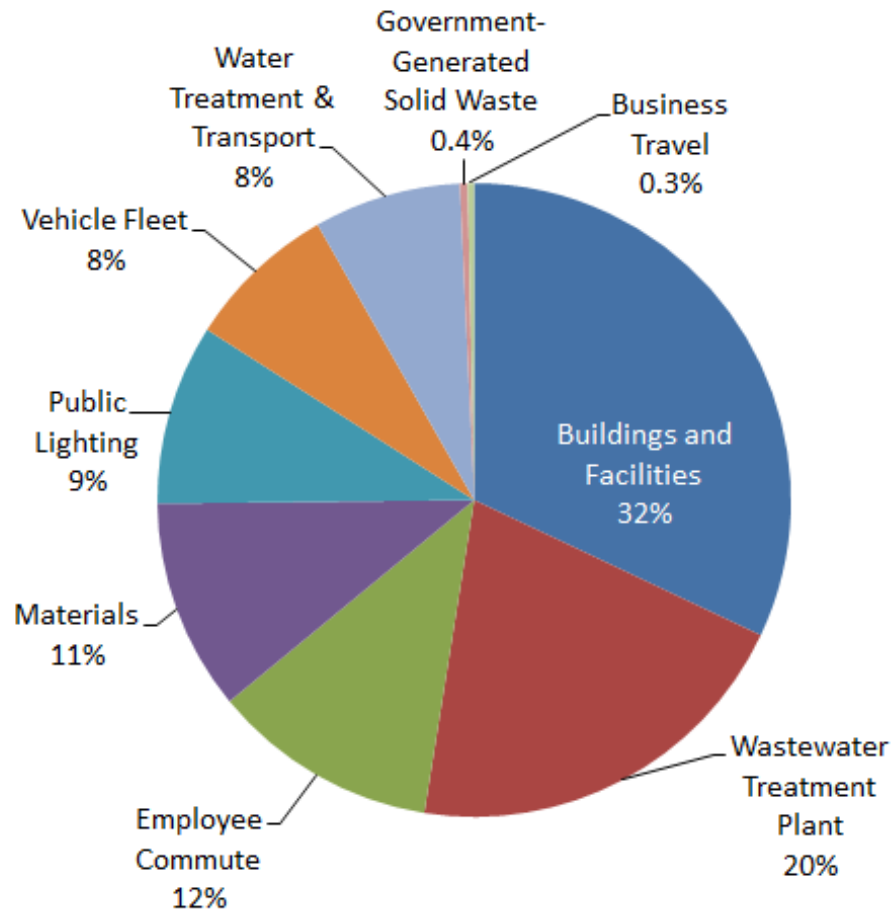
Fleet – 5%

**Overall: 27% decrease from 2008 to 2011**

# City Facilities – Other Emission Sources



2011 GHG Emissions by Sector



# Next Steps



# Questions



## Energy Efficiency Upgrades at City Facilities

[http://www.bouldercolorado.gov/index.php?option=com\\_content&view=article&id=13734&Itemid=2092](http://www.bouldercolorado.gov/index.php?option=com_content&view=article&id=13734&Itemid=2092)